MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2015/2016

BPO2864 – PRODUCTION AND OPERATIONS MANAGEMENT

(All sections / Groups)

29 FEBRUARY 2016
02:30 p.m – 04:30 p.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 5 pages with 5 Questions only excluding the cover page.
2. Section A: Answer all **TWO (2)** questions.

   Section B: Answer any **TWO (2)** of the **THREE (3)** questions.
3. The distribution of the marks for each question is given.
4. Please write your answers in the **Answer Booklet** provided.

SECTION A

Answer **ALL** questions in this section.

QUESTION 1

A manager must decide on the size of a video arcade to construct. The manager has narrowed the choices to two: large or small. If the decision is to build a small facility and it turns out that demand is low, the payoff will be 40,000. For a small facility with high demand, there are three choices: *Do nothing*, *work overtime* and *expand* and the payoff would be \$40,000, \$50,000 and \$55,000 respectively. For a large facility with low demand, there are two choices: *Do nothing* and *reduce prices* with a payoff of -\$10,000 and \$50,000 respectively. If the decision is to build a large facility and it turns out that the demand is high, the payoff will be \$70,000. The probability of low demand is 0.4 and the probability of high demand is 0.6

a) Construct a decision tree indicating the payoffs. (7 marks)

b) Determine the expected value of each initial alternative. (8 marks)

c) What would be your advice to the manager, to build a large facility or small facility; and why? (4 marks)

d) What are the **seven** basic steps in building the Quality Function Deployment (QFD)? Explain in your own words. (6 marks)

(Total: 25 marks)

Continued .....

QUESTION 2

a) Immediately upon completing his studies, Muhammad Danial decided to continue the 'Keropok Lekor' business that was started by his mum since he was small. His ambition was to eventually penetrate into the Asian market. During the last 8 months, Danial managed to export a substantial quantity of Keropoks in the Asia region. Armed with the knowledge that he acquired through the Operations Management studies in his university, Danial decided to test the use of exponential smoothing to see how well the technique works in predicting export quantities.

Month	Actual Keropok shipped (in cartons)
1	42
2	40
3	43
4	40
5	41
6	39
7	46
8	44
9	45
10	38
11	40
12	?

Using two values, ($\alpha = .10$ and $\alpha = .40$), assist Danial in

(i) Comparing the actual data with the forecasted data using each of the two values by computing the detailed calculations for $\alpha = .10$ and $\alpha = .40$.

(10 marks)

(ii) Finding the absolute deviations and the MAD (Mean Absolute Deviation).

(4 marks)

b) What is Forecasting? (3 marks)

c) Describe **three** popular measures of forecast accuracy. (3 marks)

d) Explain different forecasting time horizons with examples. (5 marks)

(Total: 25 marks)

Continued.....

SECTION B

Answer any **TWO** questions in this section.

QUESTION 3

a) Nancy's Cake shop stocks a high volume item that has a normally distributed demand during the reorder period. The average daily demand is 70 units, the lead time is 4 days, and the standard deviation of demand during the reorder period is 15.

(i) How much safety stock provides a 95% service level to Nancy?

(4 marks)

(ii) What should the reorder point be?

(4 marks)

b) How does aggregate planning in services differ from aggregate planning in manufacturing?

(8 marks)

c) Many business organisations resort to manipulation of inventories, production rates, labour levels, capacity and other controllable variables as means to absorb demand fluctuations or to smooth out changes in the demand pattern or the planning period. In your opinion, what are the ***downside*** of:

(i) Varying the size of the workforce to meet demand requirements?

(5 marks)

(ii) Varying production rates through overtime or idle time?

(4 marks)

(Total: 25 marks)

Continued.....

QUESTION 4

A local distributor for a national tire company expects to sell approximately 9,600 steel-belted radial tires of a certain size and tread design next year. Annual carrying cost is $16 per tire and ordering cost is $75. The distributor operates 288 days a year.

a) What is the EOQ? (4 marks)

b) How many times per year does the store reorder? (4 marks)

c) What is the length of an order cycle? (4 marks)

d) What is the total annual cost if the EOQ quantity is ordered? (4 marks)

e) Name the different kinds of inventories in an organization with example. (4 marks)

f) Shrinkage and Pilferage are two constant challenges that wholesalers and retailers have to face with. Suggest at least **two (2)** techniques, they can adopt to minimize or eradicate shrinkages and pilferages. (5 marks)

(Total: 25 marks)

Continued .....

QUESTION 5

a) Write down Ohno's **seven** wastes with appropriate examples. (7 marks)

b) What are the 5Ss in just-in-time? Explain in details. (5 marks)

c) What are the goals of JIT partnerships? (3 marks)

d) Zanan Furniture Inc., a firm that produces rustic furniture, desire to move toward a reduced lot size. Zanan Furniture's production analyst, Aleda determined that a 2-hour production cycle would increase the inventory turnover for the company. Determine the optimum setup time basing on the following data.

D = Annual demand = 400,000 units

d = Daily demand = 400,000 units in 250 days = 1,600 units per day

p = Daily production rate = 4,000 units per day

Q_p = EOQ desired = 400 (which is the 2-hour demand; that is, 1,600 per day per four 2-hour periods)

H = Holding cost = 20 per unit per year

Hourly labor rate = $30

S = Setup cost (to be determined)

(10 marks)

(Total: 25 marks)

End of Page

FORMULAE

$$Q^* = \sqrt{\frac{2DS}{H}}$$

Where, D = Annual demand
S = Setup cost
H = Holding Cost

$$TC = \frac{D}{Q}S + \frac{Q}{2}H$$

* TC = Carrying (Setup) Cost + Ordering Cost

$$Q_p = \sqrt{\frac{2DS}{H(1-d/p)}}$$

$$F_t = F_{t-1} + \alpha(A_{t-1} - F_{t-1})$$

where

F_t = new forecast

F_{t-1} = previous period's forecast

α = smoothing (or weighting) constant ($0 \leq \alpha \leq 1$)

A_{t-1} = previous period's actual demand

$$MAD = \frac{\sum |\text{Deviations}|}{n}$$